CLAIMS

What is claimed is:

1. A force generator comprising:

a first circular member defined about a first axis to define a first inner diameter, said first circular member having a first radius;

an second circular member defined about a second axis to define a second radius, said second radius one-half said first radius, said second circular member movable to simultaneously complete one revolution about said second axis and one orbit around said first axis; and

a mass located at a circumference of said second circular member to generate a vibratory inertial force.

2. The force generator as recited in claim 1, wherein said vibratory inertial force is a sinusoidal inertial force in a straight line.

3. The force generator as recited in claim 1, wherein said path of the mass is two-cusp hypocycloid.

4. The force generator as recited in claim 1, wherein said first circular member comprises a ring gear.

5. The force generator as recited in claim 1, wherein said second circular member comprises a planet gear.

6. The force generator as recited in claim 1, further comprising a crank which mounts said second circular member, said crank rotates about said first axis.

7. The force generator as recited in claim 6, further comprising a motor which drives said crank.

8. The force generator as recited in claim 6, further comprising an opposed circular counter member mounted to said crank.

9. The force generator as recited in claim 1, wherein said opposed circular counter member comprises a planet gear.

10. The force generator as recited in claim 1, further comprising a counter balance for said second circular member.

11. The force generator as recited in claim 1, wherein said first circular member comprises a ring.

12. The force generator as recited in claim 11, wherein said second circular member comprises a wheel which rolls within said ring.

13. A method of force generation for active vibration control comprising the steps of:

(1) defining a circular path about a first axis;

(2) defining a second circular member about a second axis;

(3) locating a mass at a circumference of the second circular member; and

(4) controlling movement of the second circular member about the circular path such that the second circular member simultaneously completes one revolution about the second axis and one orbit around said first axis to generate a vibratory inertial force.

14. A method as recited in claim 13, further comprising the step of:

counterbalancing the second circular member.

15. A method as recited in claim 13, further comprising the step of:

interconnecting the second circular member and a opposed circular counter member, the opposed circular counter member movable about the circular path.

16. A method as recited in claim 13, further comprising the step of:

moving the second circular member at a constant angular velocity.

17. A method as recited in claim 13, further comprising the step of:

(a) interconnecting the second circular member and a counterbalance with a crank; and

(b) rotating the crank about the first axis.

18, A method as recited in claim 13, further comprising the step of:

(5) transmitting the vibratory inertial force of said step (4) to a helicopter fuselage to minimize the sensed vibratory response to forces from a main rotor assembly.